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TO: The Honorable Commissioner of Patents
Washington, District of Columbia 20031

CERTIFICATE OF EXPRESS MAIL

RECEIPT NUMBER EI633572121US

I, James F. Leggett, attorney for applicant William M. Owens, hereby
Certifies that the following documents, for filing of his Application for Patent on
his Feedworks Device, were deposited with the United States Postal Service,
the Express Mail fee prepaid thereon and properly addressed to the
Commissioner of Patents and Trademarks on this date:

1. Filing Fee of \$395
2. Petition
3. Verified Statement Claiming Small Entity Status Independent Inventor
4. Verified Statement By Non-inventor Supporting Claim By Another For Small Entity Status
5. Declaration of Inventor and Power of Attorney
6. Abstract
7. Specification and Claims
8. Drawings
9. Information Disclosure Statement

Dated this 1st day of April, 1998

A handwritten signature in cursive script, reading "James F. Leggett", is written over a horizontal line.

JAMES F. LEGGETT
Registered patent Attorney
Registration No. 28,733
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1 NAME: FEEDWORKS DEVICE
2 Inventor: William M. Owens
3 5716 N. 33rd, Apartment 1
4 Tacoma, Washington 98407

5 BACKGROUND OF THE INVENTION

6 This invention relates to a mechanism to move rigid flat material through a cutter so that
7 the material remains in constant orientation to the cutter as it passes through the cutter and, more
8 particularly, to a mechanism to move wooden boards containing defects through trimmer saws
9 to yield useable boards.

10 It is known that boards with defects or waness can be optically scanned and the largest
11 piece of useable wood cut therefrom by computer analysis. See S. J. Oppeneer, U. S. Patent
12 No. 4,794,963 and J. M. Idelsohn, U. S. Patent No. 4,207,472. The previous attempts to
13 accomplish the goals of this invention have utilized standard rollers to move the boards past the
14 cutting saws plus hold-down rollers from above and a fence along one side. See U. Moilanen,
15 U. S. Patent No. 4,485,705 and E. G. Fornell, U. S. Patent No. 4,269,245. The way the prior
16 art attempts to maintain constant orientation of the boards to the trimming saws is by means of
17 gripping clamps which damage the wood being trimmed. See A. U. Jones, U. S. Patent No.
18 5,088,363 and G. W. Head Jr., U. S. Patent No. 5,381,712.

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20
21 Another known means for transporting the material to the cutter is a slat-bed transport
22 device, which consists of multiple parallel chains on which cross "slats" are affixed at regular
23 intervals along a continuous loop of traveling chain. The chains usually ride in a track and
24 there are 'V' block attachments on the underside of the cross slats which ride upon a 'V' guide.
25 This means of transporting material to a cutter has many complex parts which are more
26 expensive to manufacture and to maintain than this invention and require regular lubrication,
27 which lubricant can transfer to the material being transported and stain it. The metal slats do
28

not maintain the alignment of the material with the cutter unless they are equipped with spikes or a rough surface which mars the material to be cut just as do the gripping clamps of referred to above.

The primary object of this invention is to provide a device to maintain the precise orientation of a board to cutting or shaping mechanisms and to move the board through the cutting or shaping mechanisms at a constant rate without marring the surface of the wood.

SUMMARY OF INVENTION

These objects are achieved by this invention in that boards are fed through cutting saws, being adjustable in distance from each other, by means of an input and an out-put continuous drive conveyor belt with non-skid face being maintained in constant alignment with the cutting saws by means of Guide 'V' belts bonded to their reverse side, which 'V' belts communicate with corresponding 'V' grooves in the power rollers and the rollers of the feed bed, and constant alignment with each other by a timing/drive belt which transfers the motor drive to the inside rollers of the output and the input sides, while spring powered hold-down rollers press the board against the non-skid face of the belt, so that the board does not move side to side or chatter up and down when it is being cut.

The novel features of the invention will be best understood from the following description in light of the accompanying drawings. While particular embodiments of the present invention are shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from this invention in its broader aspects and, therefore, the aim of the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of this invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side aspect view of the Feedworks Device from the input end;

1 FIG. 2 is a side aspect view of the Feedworks Device from the output end;
2
3 FIG. 3 is a break out view of the saws arrangement from above;
4
5 FIG. 4 is a break out view of a roller and the bed of the Feedworks Device;
6
7 FIG. 5 is an aspect view of the surface of the conveyor belt which contacts the product
8 to be cut;
9
10 FIG. 6 is an aspect view of the surface of the conveyor belt opposite from that shown
11 in Figure 5;
12
13 FIG. 7 is a cross sectional view of the conveyor belt;
14
15 FIG. 8 is an aspect view of an alternative form of the Feedworks Device from the output
16 end.

17 DESCRIPTION OF THE PREFERRED EMBODIMENTS

18 With specific reference to Figures 1 and 2, the Feedworks Device (1) is shown being
19 comprised of an input cover (4), a right side cover (3), a left side cover (5), a top cover (2) with
20 window (7) of opaque shatter-proof material, and an output end cover (6) of rigid material, such
21 as steel, and strengthened by reinforcement plates (40) as necessary to accommodate the
22 operating elements. The preferred embodiment thereof being comprised of an input continuous
23 drive conveyor belt (10) and an output continuous drive conveyor belt (41), each of identical
24 composition and having a non-skid top surface (28), such as No. 37 Scandera Red Carbox Rough
25 Top on 3 ply 135 pound polyester 9/32 inch thick with an underside of Friction Surface
26 (Caroxilated nitril X F.S.), a bottom surface (29) to which is bonded one or more Guide 'V'
27 belts (30), such as a Browning Manufacturing Company Grip Notch grip belt commonly known
28 as an "A" section belt and having scallop shaped cuts partially through its thickness across its
width and regularly spaced along its length, parallel to their lengths.

The one continuous drive conveyor belt (10) travels around an inside feed roller on the

1 input side (42) and a feed roller at the input end (8) and the other continuous drive conveyor belt
2 (41) travels around an inside feed roller at the output side (43) and a feed roller at the output
3 end (34). The distance from the respective inside and end rollers being adjustable at the feed
4 roller mount (9), (16) so as to maintain proper tension on the continuous drive conveyor belt so
5 that it does not slip on the rollers.
6

7 With reference to Figures 4, 5, and 6, it is shown said rollers are provided with one or
8 more 'V' grooves (31) to accept the guide 'V' belt (30), as is the feed bed (32) provided with
9 one or more 'V' grooves (33) to accept the guide 'V' belt (30) on the bottom surface (29) of the
10 continuous drive conveyor belt (10, 41) so that the continuous drive conveyor belt remains in
11 constant horizontal relationship to the feed rollers and the circular saw blade(s) (23, 24) or
12 shaping tool(s) (46). The speed of the input continuous drive conveyor belt (10) is matched with
13 the speed of the output continuous drive conveyor belt (41) by means of a timing belt (15)
14 between the powered shaft of the inside feed roller on the output end (13), powered by a feed
15 roller drive motor (21), to the slaved shaft of the inside feed roller on the input end (14), while
16 the feed rollers at the input end (8) and the feed roller at the output end (34) are turned by the
17 continuous drive conveyor belts. Thus all feed rollers have the same operating revolutions per
18 minute (RPM).
19
20

21 With specific reference to Figure 3, the relationship between the input continuous drive
22 conveyor belt (10) and the output continuous drive conveyor belt (41) and the circular saw
23 blade(s) (23, 24) or shaping tool(s) (46), adjustably set along the length of the saw drive shaft
24 (25) by means such as an adjustable mounting screw for the saw blade (36) removably set into
25 a mounting channel (35) which runs along the length of the saw drive shaft (25) inside the saw
26 drive shaft mount (26) on the inside of the right side cover (3) and the left side cover (5), with
27 the saw drive shaft extending through the right side cover (3) so that the saw drive shaft slave
28

1 pulley (38) mounted at the end of the saw drive shaft (25) communicates to the saw blade drive
2 motor (27) via a saw drive shaft drive belt (39) to the saw motor drive pulley (37).

3
4 With reference to Figures 1 and 3, it is shown that once a wooden board (44) or other
5 flat, rigid, cuttable piece of material enters the Feedworks Device (1) on the input continuous
6 drive conveyor belt (10) over the feed roller at the input end (8), it is held in a fixed horizontal
7 relationship to the circular saw blade(s) (23, 24) or shaping tool(s) (46) by the non-skid top
8 surface (28) of the input continuous drive conveyor belt (10) and a hold down roller at the input
9 end (11) and an inside hold down roller on the input side (22), said hold down rollers having
10 non-marring surface and applying pressure to the top of the wooden board (44) by means of a
11 spring loaded arm (12, 45) while the Feedworks Device (1) has a similar output continuous drive
12 conveyor belt (41) with an inside hold down roller on the output side (17) and a hold down
13 roller at the output end (19), applying sufficient pressure to the top of the sawn pieces of the
14 wooden board (44) by means of a spring or pneumatic cylinder loaded arm (12, 18, 20, 45),
15 so that the wooden board (44) being cut maintains a constant orientation to the saw blade (23,
16 24) or shaping means.
17

18
19 With reference to Figure 8, an alternative embodiment of the invention is comprised of
20 a single non-skid continuous conveyor belt (47) which spans the input (4) to the output (6) end
21 covers in situations where the cutting or shaping means (46) is above and does not interfere with
22 the non-skid continuous conveyor belt. Such alternative cutting or shaping means include router
23 cutting tools and overhead saws.

24
25 Also in reference to Figures 2 and 8, it is apparent that the single saw drive shaft (25)
26 can be replaced with multiple saw or shaper cutters (49), each with its own power drive means,
27 such as arbor motors (48) and located along the run of the continuous drive conveyor belt(s) (10,
28 41, 47) to cut, shape, or trim the edges, of the wooden board.

1 Also with reference to Figures 2 and 3, it is apparent that non-skid continuous conveyor
2 belts (10, 41, 47) can be combined with more than one cutting or shaping tool and combined to
3 form multiple machining stations. Another alternative embodiment of the invention utilizes high
4 pressure abrasive cutting means.
5

6 I CLAIM:

7 1. An improved apparatus for feeding flat, rigid, cuttable material through a powered
8 cutting means comprised of:

9 (a) an input non-skid continuous conveyor belt means, for moving the material to be cut
10 in a direction parallel to its length to a cutting means;

11 (b) an output non-skid continuous conveyor belt means for moving the material after it
12 is cut in a direction parallel to its length away from the cutting means;

13 (c) a hold down means to hold the material to be cut against the non-skid continuous
14 conveyor belt means;

15 (d) a guide means to maintain the position of the non-skid continuous conveyor belt
16 means relative to the cutting means;

17 (e) a drive means to power in input and an output non-skid continuous conveyor belt
18 means so their rate of movement (RPM) is identical.
19

20 2. Apparatus as defined in Claim 1, wherein said power cutting means includes one or
21 more circular saw blades adjustably positioned along the length of a saw drive shaft and
22 positioned between an input non-skid continuous conveyor belt means and an output non-skid
23 continuous conveyor belt means, parallel to their length and powered by a motor means
24 communicating with the saw drive shaft.
25

26 3. Apparatus as defined in Claim 1, wherein said non-skid continuous conveyor belt
27 means includes a section of material having a length greater than its width and having a non-skid
28

1 top surface and a durable bottom surface to which is bonded one or more guide 'V' belts,
2 extending the length of the non-skid continuous conveyor belt and extending a distance from the
3 bottom surface of the non-skid continuous conveyor belt and having a width so said guide 'V'
4 belt engages a 'V' groove in the drive means as defined in Claim 1, and having its end joined
5 together to form a continuous conveyor belt.
6

7 4. An apparatus as defined in Claim 1, wherein said drive means to power an input and
8 output non-skid continuous conveyor belt means so their rate of movement (RPM) is identical
9 includes an inside feed roller on the input side and a feed roller at the input end, said rollers,
10 and a feed bed spanning the distance between them, having 'V' grooves in their faces of a size
11 to accommodate the guide 'V' belt on the bottom surface of the non-skid continuous conveyor
12 belt means, said non-skid continuous conveyor belt means being securely fitted around said feed
13 rollers by adjusting the mounting means for the feed rollers on the input end, wherein the end
14 of the inside feed roller on the input side extends beyond a right side cover and its shaft engages
15 a timing belt which is turned by the shaft of the inside feed roller on the output side which also
16 extends beyond the right side cover, said inside feed roller on the output side being powered by
17 a motor means at the end of its shaft which extends beyond a left side cover, so that both inside
18 feed rollers travel at the same RPM which, in turn, results in the feed roller at the input end
19 and the feed roller at the output end also revolving at the same RPM, being passively driven
20 only by the non-skid continuous conveyor belt means.
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23 5. An apparatus as defined in Claim 1, wherein the hold down means to hold the
24 material to be cut against a non-skid continuous conveyor belt means includes a plurality of hold
25 down rollers with non-marring surfaces, held down against the material to be cut by spring
26 loaded arm means, so said material to be cut is held in contact with the non-skid continuous
27 conveyor belt means and in constant relation to the cutting means as it passes through the cutting
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1 means.

2 6. An apparatus as defined in Claim 2, wherein the powered cutting means is one or
3 more circular saws, suitable for cutting wood boards, and capable of being set along the length
4 of the saw drive shaft by remote means, either manually or by computer means.
5

6 7. An apparatus as defined in Claim 3, wherein the non-skid continuous conveyor belt
7 means is 9/32 inch thick and comprised of a non-skid top surface of No. 37 Scandera Red
8 Carbox Rough Top on 3 ply 135 pound polyester with a bottom surface of Friction Surface
9 (Caroxilated nitril X F.S.), to which is bonded one or more Browning Manufacturing Company
10 Grip Notch grip belts, commonly known as an "A" section belt, and having scallop shaped cuts
11 partially through its thickness across its width and regularly spaced along its length parallel to
12 the length of the non-skid continuous conveyor belt.
13

14 8. An apparatus as defined in Claim 5 wherein the hold down means to hold the material
15 to be cut against a non-skid continuous conveyor belt means includes a plurality of hold down
16 rollers with non-marring surfaces, held down against the material to be cut by pneumatic
17 cylinder loaded arm means, so said material to be cut is held in contact with the non-skid
18 continuous conveyor belt means and in constant relation to the cutting means as it passes through
19 the cutting means.
20

21 9. An apparatus as defined in Claim 1, wherein the input non-skid continuous conveyor
22 belt means and the output non-skid continuous conveyor belt means are comprised of a single
23 non-skid continuous conveyor belt means for use in situations where the powered cutting means
24 does not come into interference with the non-skid continuous conveyor belt means.
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26 10. An apparatus as defined in Claim 1, wherein the improved apparatus is combined
27 in series with one or more other units of the improved apparatus so that multiple cutting or
28 shaping means may be applied to the flat, rigid, cuttable material.

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11. An apparatus as defined in Claim 1, wherein said power cutting means includes one or more high pressure abrasive cutting means.

12. An apparatus as defined in Claim 1, wherein one or more cutting means are comprised of router cutters.

13. An apparatus as defined in Claim 1, wherein said powered cutting means includes one or more circular saw blades or shaping means, each powered by a separate arbor motor means and positioned along side or above one or more non-skid continuous conveyor belt means.

1 **OATH OR DECLARATION OF INVENTOR**

2 **AND POWER OF ATTORNEY**

3
4 AS A BELOW-NAMED INVENTOR, I hereby declare:

5 That pursuant to 37 CFR §1.68, I have been warned that willful false
6 statements and the like are punishable by fine or imprisonment or both [18
7 USCA §1001] and may jeopardize the validity of the application or any patent
8 issued thereon;
9

10 That I further confirm that all statements made on my own knowledge are
11 true and that all statements made on information and belief are believed to be
12 true;
13

14 That I, William M. Owens, make this Declaration in accordance with 37
15 CFR §1.63 in support of my application for an utility patent upon my Feedworks
16 Device;
17

18 That I am the sole inventor of the means claimed in the accompanying
19 specification, am a citizen of the United States of America and reside at 5716
20 N. 33rd, Apartment 1, Tacoma, Pierce County, State of Washington 98407;
21

22 That I have reviewed and understand the contents of the specification,
23 including the claims, as amended by any amendment specifically referred to in
24 the Oath or Declaration;

25 That I believe that I am the original and first inventor of the subject matter
26 which is claimed and for which an utility patent is sought;

27 That I acknowledge the duty to disclose information which is material to
28

1 the examination of the application in accordance with 37 CFR §1.56(a) and in
2 accordance therewith have commissioned a patent search, the results of which
3 are incorporated in the application;
4

5 That I hereby appoint James F. Leggett, Reg. No. 28,733, to act as my
6 attorney before the Patent and Trademark Office and to transact all business
7 therewith in my name and to receive my certificate;

8 I declare under penalty of perjury under the laws of the State of
9 Washington and the United States the foregoing to be true.
10

11 Executed this 1 day of April, 1998 at TACOMA, Washington.

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13 
14 WILLIAM M. OWENS
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1 NAME: FEEDWORKS DEVICE
2 INVENTOR: William M. Owens
3 5716 N. 33rd, Apartment 1
4 Tacoma, Washington 98407

5 ABSTRACT

6 An improved apparatus for feeding flat, rigid material through a cutter
7 comprising a continuous drive conveyor belt with a non-skid face, having one
8 or more Guide 'V' belts bonded to its reverse side parallel to the direction of
9 movement, which 'V' belts communicate with corresponding 'V' grooves in the
10 power rollers and the rollers of the feed bed, another continuous drive conveyor
11 belt on the out-put side of the cutter, the movement of both conveyors being
12 synchronized by a timing/drive belt which transfers the motor drive to the inside
13 rollers of the out-put and the in-put sides, and having from above regularly
14 spaced hold-down rollers along the span of both conveyors to keep the rate of
15 movement of the flat material through the cutter consistent. This apparatus has
16 its preferred application in the lumber industry for trimming defects and/or
17 waness from wood boards, so that the boards maintain consistent position in the
18 horizontal plane while traveling through the cutters.
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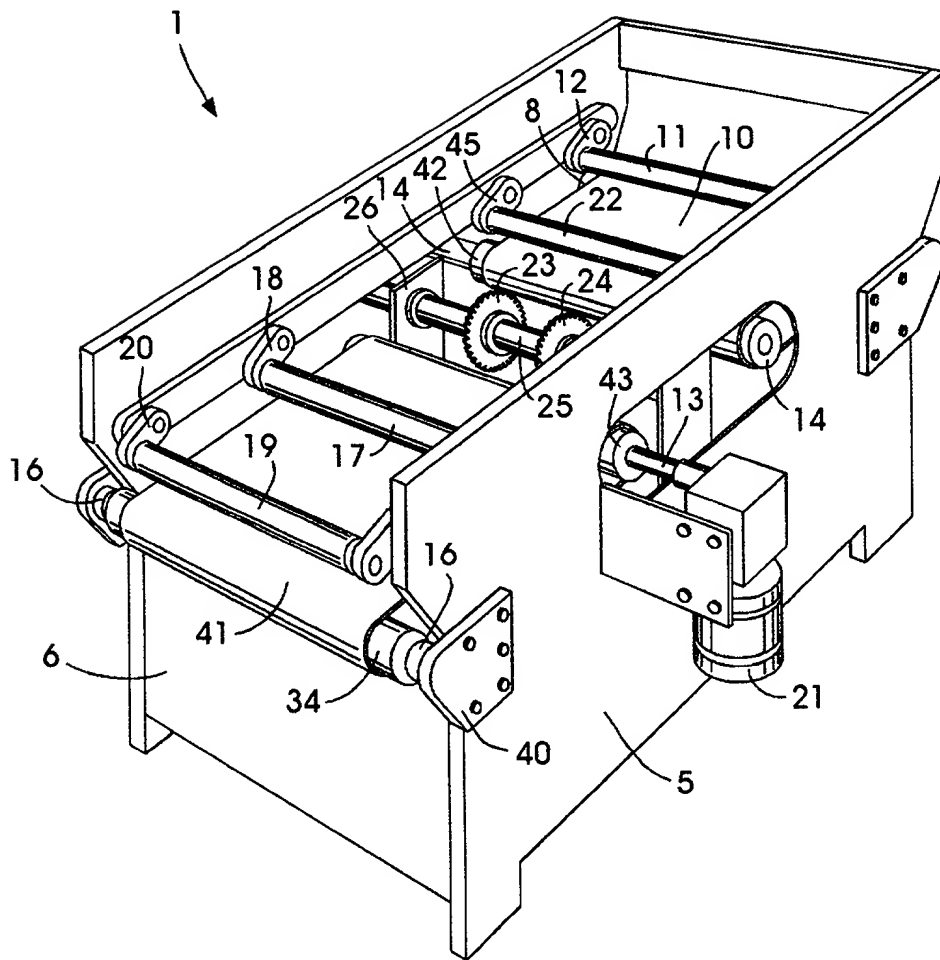


FIG. 2

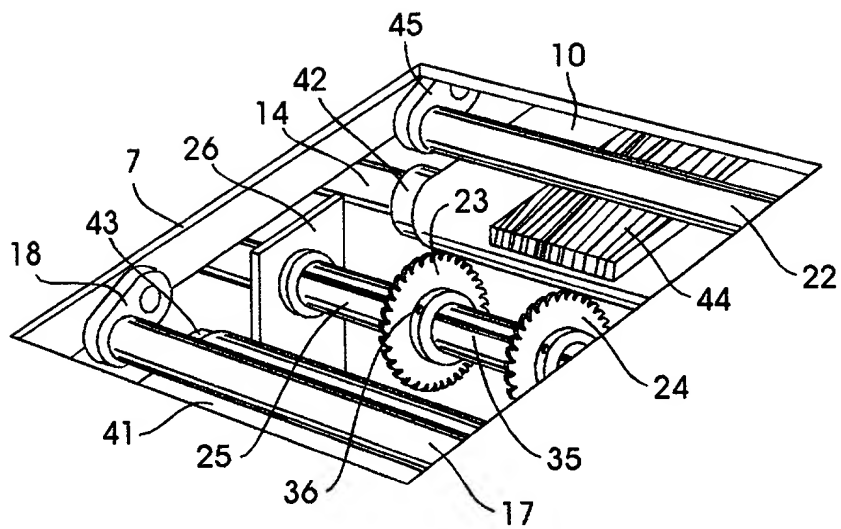


FIG. 3

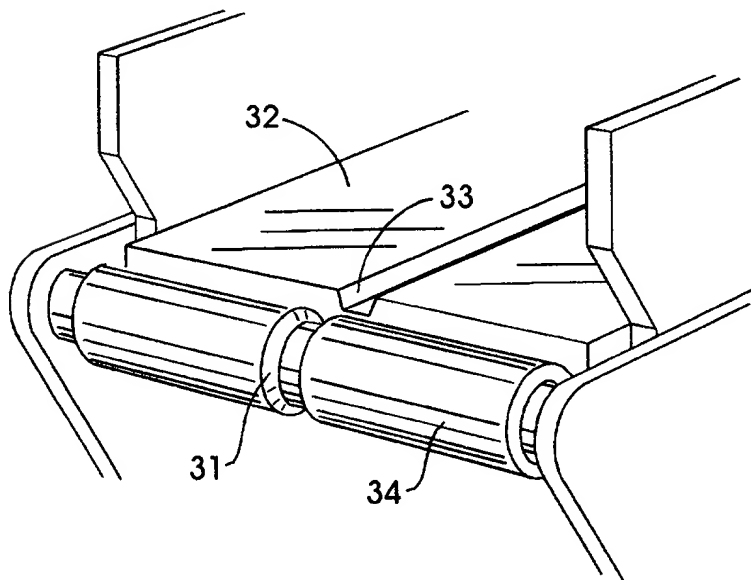


FIG. 4

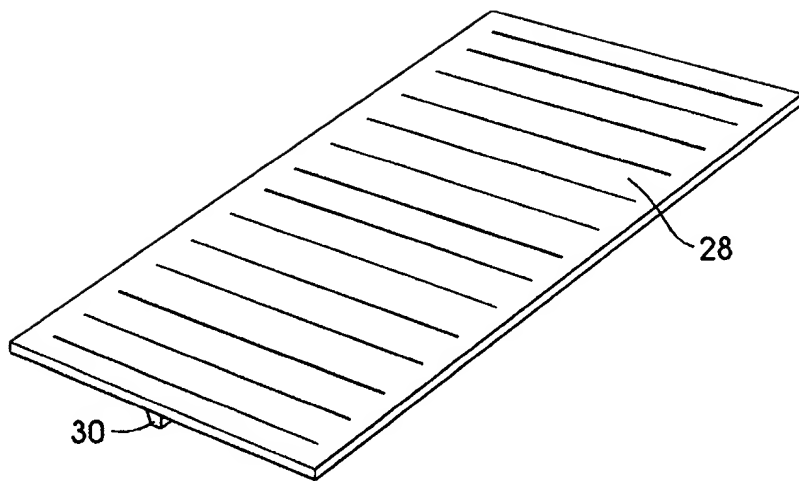


FIG. 5

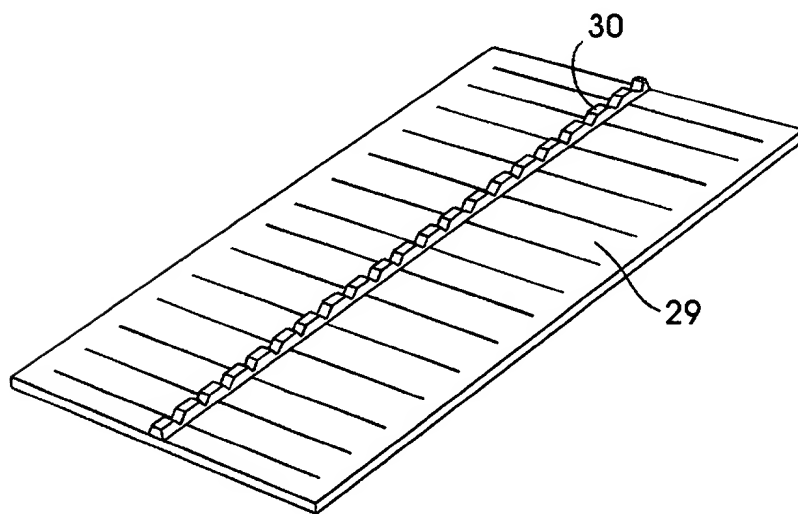


FIG. 6



FIG. 7

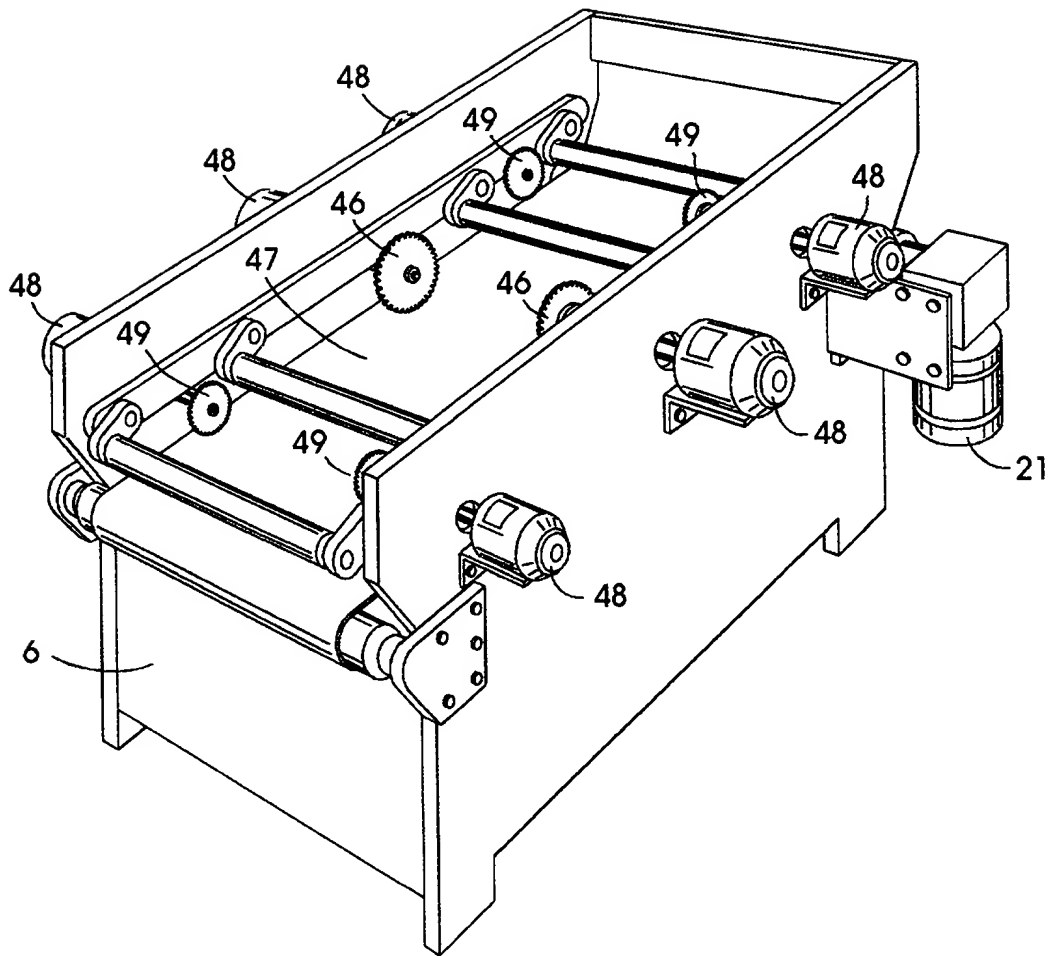


FIG. 8

Applicant or Patentee: WILLIAM M. OWENS
Serial or Patent No. _____
Filed or Issued: _____
For: FEEDWORKS DEVICE

Attorney's Docket
No. 28,733

**VERIFIED STATEMENT (DECLARATION) BY A NON-INVENTOR
SUPPORTING A CLAIM BY ANOTHER FOR SMALL ENTITY STATUS**

I hereby declare that I am making this Verified Statement to support a claim by William M. Owens for small entity status for purposes of paying reduced fees under §41(a) and (b) of Title 35, United States Code, with regard to the invention entitled FEEDWORKS DEVICE by inventor WILLIAM M. OWENS described in:

☒ the specification filed herewith
☐ application serial no. _____ filed _____
☐ patent no. _____ issued _____.

I hereby declare that I would qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying fees under §41(a) and (b) of Title 35, United States Code, if I had made the above identified invention.

I hereby declare that the above identified inventor qualifies as a independent inventor and small entity as defined in 37 CFR 1.9(c) and has not assigned, granted, conveyed or licensed and is under no obligation under contract or law to assign, grant, convey or license any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which he/she have assigned, granted, conveyed or licensed or am under an obligation under contract or law to assign, grant, convey or license any rights in the invention is listed below:

☒ no such person, concern or organization
☐ persons, concerns or organizations listed below:

NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities.
(37 CFR 1.27)

Full Name: _____

Address: _____

☐ individual ☐ small business concern ☐ nonprofit organization

Full Name: _____

Address: _____

☐ individual ☐ small business concern ☐ nonprofit organization

Full Name: _____

Address: _____

☐ individual ☐ small business concern ☐ nonprofit organization

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying or at the time of paying the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon or any patent to which this verified statement is directed.

Name of Person Signing: BARBARA J DORIA

Address of Person Signing: 1919 NO PEARL STE B2 TACOMA, WA 98406

Signature: Barbara J Doria

Date: 3/4/98

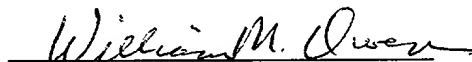
P E T I T I O N

TO: The Honorable Commissioner of Patents
Washington, District of Columbia 20031

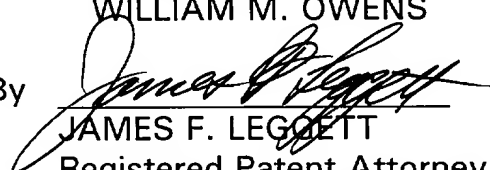
Sir:

Your petitioner, WILLIAM M. OWENS, a citizen of the United States of America and a resident of Tacoma, State of Washington, whose address is 5716 No. 33rd, Apt. 1, Tacoma, Washington 98407, prays that Letters Patent may be granted to applicant for the Feedworks Device, set forth in the annexed specification.

Respectfully submitted,


WILLIAM M. OWENS

By


JAMES F. LEGGETT
Registered Patent Attorney
Registration No. 28,733

1901 South I Street
Tacoma, Washington 98405
(206) 272-7929

Applicant or Patentee: WILLIAM M. OWENS
Serial or Patent No. _____
Filed or Issued: _____
For: FEEDWORKS DEVICE

Attorney's Docket
No. 28,733

**VERIFIED STATEMENT (DECLARATION) CLAIMING
SMALL ENTITY STATUS (37 CFR 1.9(f) AND 1.27(b))
INDEPENDENT INVENTOR**

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under §41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled FEEDWORKS DEVICE described in:

☒ the specification filed herewith
☐ application serial no. _____ filed _____
☐ patent no. _____ issued _____

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed or licensed or am under an obligation under contract or law to assign, grant, convey or license any rights in the invention is listed below:

☒ no such person, concern or organization
☐ persons, concerns or organizations listed below

NOTE: Separate verification statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

Full Name: _____

Address: _____

☐ individual ☐ small business concern ☐ nonprofit organization

Full Name: _____

Address: _____

☐ individual ☐ small business concern ☐ nonprofit organization

Full Name: _____

Address: _____

☐ individual ☐ small business concern ☐ nonprofit organization

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying or at the time of paying the earliest of the issue fee or any maintenance due after the date on which status as a small entity is no longer appropriate (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true; further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under §1001 of Title 18, United States Code and that such willful false statements may jeopardize the validity of the application, any patent issued thereon or any patent to which this verified statement is directed.

Name of Inventor: WILLIAM M. OWENS

Signature of Inventor: William M. Owens

Date: 4-1-98